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TO: 9072462116

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FAX NO. 9076839612

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National Park Service
U.S. Department of the Interior

Denali National Park and Preserve
Lake Clark National Park and Preserve
Katmai National Park and Preserve
Alaska



Finding of No Significant Impact

**Plate Boundary Observatory Global Positioning System Network Installation
and Maintenance in Alaska**

September 2007

Recommended: Paul R. Anderson 9/13/07
Superintendent, Denali National Park and Preserve Date

Recommended: _____
Superintendent, Lake Clark National Park and Preserve Date

Recommended: Ralph Moore 9/13/07
Superintendent, Katmai National Park and Preserve Date

Approved: [Signature] 9/18/07
Regional Director, Alaska Date

National Park Service
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Plate Boundary Observatory Global Positioning System Network Installation and Maintenance in Alaska

Denali National Park and Preserve Lake Clark National Park and Preserve Katmai National Park and Preserve

September 2006

The National Park Service has considered a request from the University NAVSTAR Consortium (UNAVCO) to install and maintain six continuous global positioning system stations (CGPS) for at least 10 years in three national park system units in Alaska. An environmental assessment was written to evaluate the environmental effects of the proposed action and the no-action alternative.

The geodetic network would complement other stations in Alaska and the continental U.S. as part of EarthScope Program's Plate Boundary Observatory (PBO). This National Science Foundation project would advance studies of earth's surface deformation across the active boundary zone between the Pacific and North American plates in Alaska. Two sites are proposed for each of the three target parks (Denali, Katmai, and Lake Clark national parks and preserves) because these are areas with active volcanism and earthquakes. Aside from measuring these major earth processes, data from these stations could be used to augment hazard forecasting and warnings and provide base stations to improve GPS measurements for resources management. Each reference station is composed of a monument assembly, solar panel array, communication antenna, and equipment enclosure.

In consultation with the Park Service, the consortium reduced its original proposed number of stations in Alaska national parks and agreed to consider co-locating facilities to the extent feasible with existing radio repeaters and seismic stations to minimize impacts to park resources and values. Three of the proposed sites are located in designated wilderness, two are in areas eligible for wilderness designation, and one is located in an area not suitable for wilderness designation.

Currently, a very sparse geodetic network exists in the western continental U.S. and Alaska. Alaska had only 16 CGPS stations at the start of the PBO Project. Compared to the full PBO network, this limited coverage contributes to a lack of understanding of basic Earth processes, (i.e., active faulting and earthquakes and volcanic hazards) resulting in public safety risks and gaps in human understanding of fundamental Earth processes. In all, the PBO network will have 142 new CGPS stations in Alaska. This proposal for 6 new CGPS stations in three parks and preserves is designed specifically to fill the gaps in, and thus increase the accuracy of, the existing geodetic network by installing the new CGPS stations in a carefully designed and integrated network.

The NPS has selected Alternative B: Proposed Action – Install New PBO Stations in Denali National Park and Preserve, Lake Clark National Park and Preserve, and Katmai National Park and Preserve with mitigation measures.

ALTERNATIVES

Two alternatives were evaluated in the EA.

Alternative A: No Action

Under the No Action Alternative, installation of PBO stations would not occur on NPS-administered lands in Denali National Park and Preserve, Lake Clark National Park and Preserve, or Katmai National Park and Preserve. The existing network and its permitted maintenance schedule would remain in place, and no improvement of seismic data collection and interpretation would result.

Denali National Park and Preserve: Use of existing analog instruments would continue at two stations outside and three stations inside Denali National Park and Preserve (Wickersham Dome, Thorofare, and Castle Rocks), along with two relay stations at Double Mountain and Mt. Healy. Three radio repeater stations exist in the Denali National Park and Preserve Wilderness.

Lake Clark National Park and Preserve: Thirteen seismic stations are currently located within Lake Clark National Park and Preserve. New NPS Remote Automated Weather Stations (RAWS) are being proposed for installation in 2008. Of the four sites recommended, two would be located in wilderness. Twelve seismic stations and one radio repeater station in Lake Clark National Park and Preserve are located in designated wilderness.

Katmai National Park and Preserve: Twenty-three seismic stations are currently within Katmai National Park and Preserve. Six new RAWS (five in wilderness) are proposed for installation in 2008. Twenty seismic stations in Katmai National Park and Preserve are located in designated wilderness.

In the long-term, each of the existing seismic stations would be visited for maintenance once every 3–4 years during the summer field season to replace batteries. The sites, with the exception of Wickersham Dome, would require use of a helicopter for access.

Alternative B: Expand Seismic Monitoring Network

Under Alternative B, UNAVCO would be issued a research permit to install six CGPS stations in national parks in Alaska. These stations would help to fill gaps in, and increase the accuracy of, the existing geodetic network, and would provide the best possible detection of seismic signals. Seismic stations must be located on bedrock at high elevations on landforms that have good long-distance lines of site to other stations for data telemetry.

UNAVCO is proposing to install six short drill-braced monuments for the CGPS stations, which are composed of a monument assembly, solar panel array, a communication antenna, and equipment enclosure. Short drill-braced monuments (SDBM) are small, hand-drilled geodetic designs that can be installed quickly. They are well-suited for environmentally sensitive areas or extremely remote locations.

A center hole and four perimeter holes are drilled at approximately a 55 degree angle 1.5–1.8 meter (m) [5-6 feet (ft)] into bedrock using a hand held, generator-powered rotary hammer. Five, 2.5 centimeter (cm) [1 inch (in)] diameter stainless steel rods that extend 1–1.4 m (3.3 to 4.5 ft) above the ground surface are inserted into the drilled holes to support the unit. A leveling adapter, geodetic grade CGPS antenna and radome [40 cm (16 in) diameter] are attached to the threaded top of the vertical leg. This type of monument is only suitable where bedrock is within 0.3 m (1 ft) of the surface.

All electronic equipment would be placed in weatherproof enclosures. Communications devices would be mounted to the top of the equipment enclosure. A VSAT antenna or a Yagi dish antenna would be used to transmit data, which would be downloaded and processed daily by the PBO Operations Center in Boulder, Colorado.

Two solar panels would be mounted on the equipment enclosure to a height that accounts for the expected snow accumulation levels at a given station site. The equipment enclosure would be connected to the CGPS by cable within conduit, which would lie on the ground surface and be covered with small rocks.

The total height of the monument is approximately 2 m (6.6 ft) including the CGPS antenna and radome. The completed SDBM stations occupy a relatively small footprint of 64 ft² (6 m²) or 0.001 ac (0.0006 ha). Installations would be small and, except for the solar panels, colored to match the surroundings. The CGPS stations are intended to remain in place until at least 2018. Of the six stations proposed for the network, two are proposed for installation in Denali National Park and Preserve, two are proposed for installation in Lake Clark National Park and Preserve, and two are proposed for installation in Katmai National Park and Preserve.

Three proposed PBO stations would be in designated wilderness areas (AC 26 Cape Gull, AC08 Cape Douglas, and AC37 Lake Clark NPS Radio Hut). AC47 Slope Mountain and AC33 N. Denali Tokosha Comm are in areas eligible for wilderness designation. Of the five stations proposed in wilderness, four would be co-located or near existing seismic or communication installations; one of the proposed CGPS stations, Station AC47 (Slope Mountain), would be located on a previously undisturbed site.

Wilderness in the parks is currently affected by existing remote installations. The new PBO stations would have impacts similar to the 5 communications stations that already exist in the designated wilderness of Denali National Park and Preserve, the 12 stations in Lake Clark National Park and Preserve that are located in designated wilderness, and the 20 stations in Katmai National Park and Preserve that are located in designated wilderness.

Five stations would require maintenance once every three years including access by helicopter, and all of the station would remain in the proposed locations until at least 2018.

Each CGPS station would require 2 days to 4 days to be installed, depending on weather conditions. All but one station would be installed using a helicopter to access the sites.

For Station AC33 (N. Denali Tokosha Comm) in Denali National Park, UNAVCO would use the Talkeetna airport to stage supplies and refuel the helicopter, as needed. Station AC56 (Wickersham Dome) would be accessible by truck and trailer.

In Lake Clark National Park and Preserve, the airport in Port Alsworth would be used for Station AC37, Lake Clark NPS Radio Hut. UNAVCO would arrange for helicopter landing permission at the Wilder B&B located on the air strip.

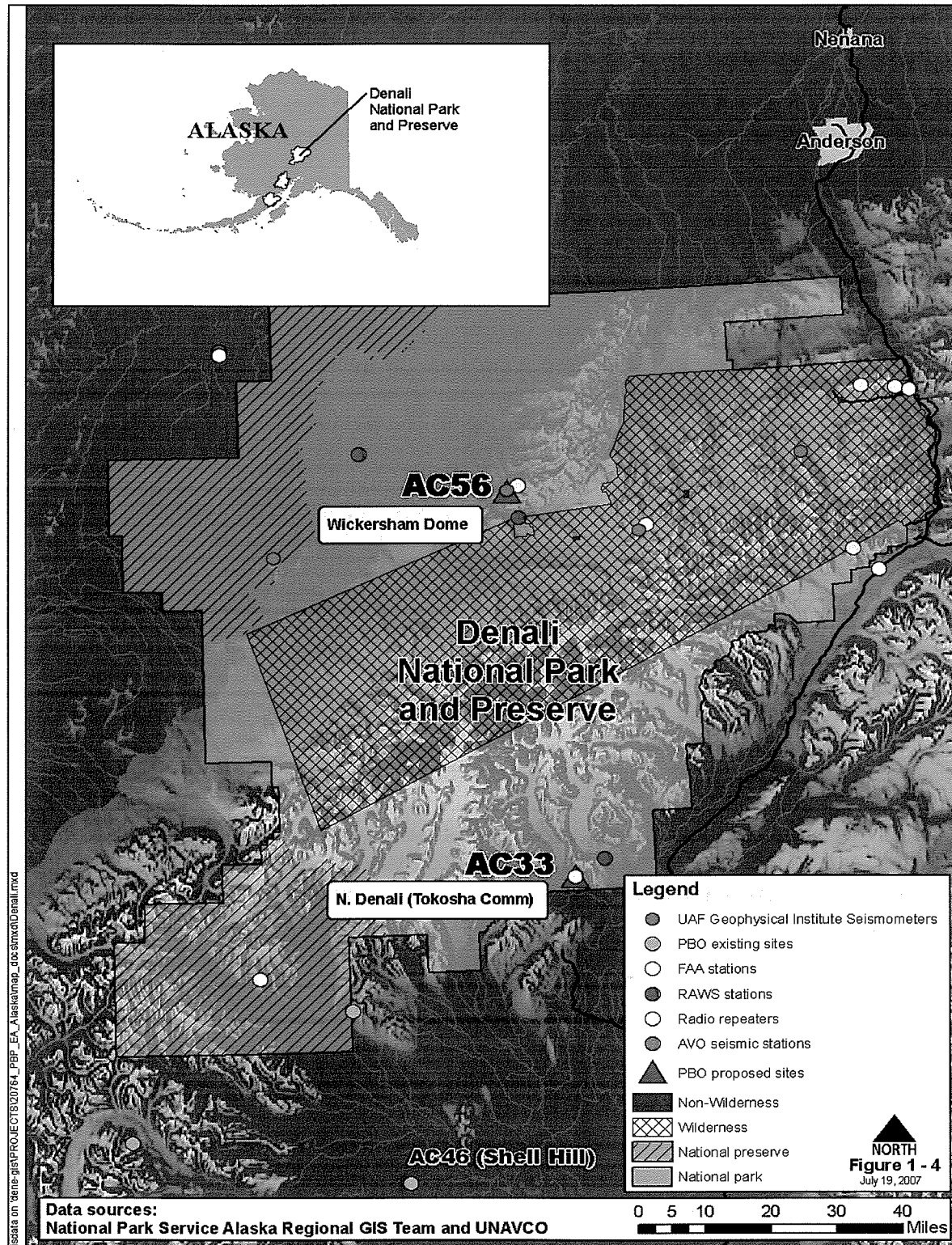
For Station AC47, Slope Mountain, UNAVCO would stage out of the Drift River Oil Terminal airstrip, which is located to the north where fuel and lodging are available.

For Station AC26 (Cape Gull), all helicopter work would be conducted out of the Kodiak airport. UNAVCO has contacted the Katmai Wilderness Lodge located near Cape Gull as a potential staging area for the PBO equipment. UNAVCO would transport gear from the lodge to the PBO station site one day, install the PBO equipment for two days, depending on weather conditions, then load the construction gear and fly back to the lodge on the fourth day.

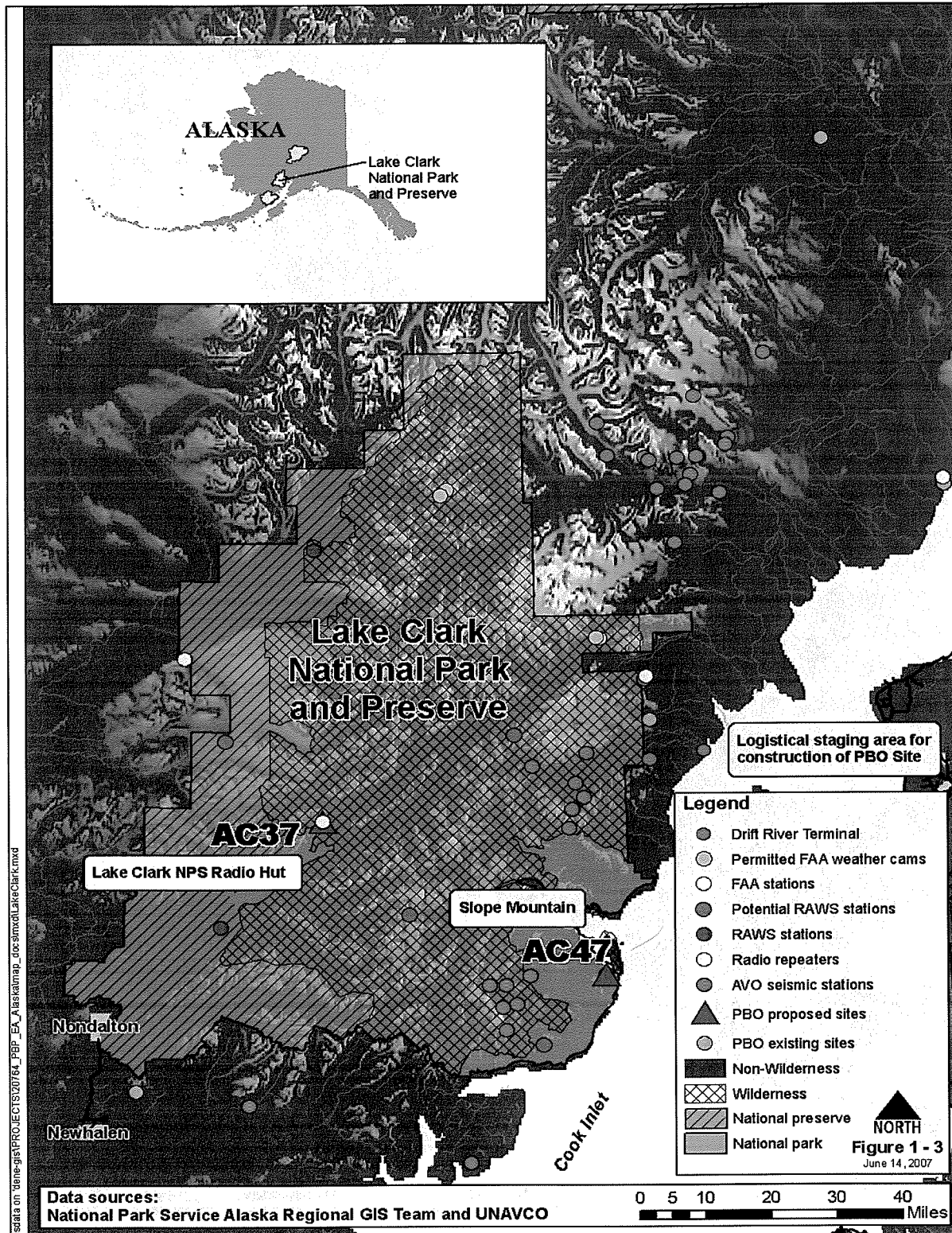
For Station AC08 (Cape Douglas), UNAVCO would use the airport at Homer (a one hour flight to the station site) and use AVO base camp on Augustine Island (a 20 minute flight from the station site) for refueling.

After the stations are operational, UNAVCO would conduct site visits only to replace back-up batteries and conduct routine maintenance. Site visits would occur approximately once every three years for each station unless equipment malfunctions. Occasionally, system malfunctions may require a visit to make repairs. Thus, with the exception of Station AC56, helicopters would likely be used for access to one or more stations in each park every three years. Station AC56 (Wickersham Dome) would be accessible by truck and trailer pursuant to the conditions of a road travel permit for the restricted portion of the Denali Park Road and the part of Skyline Drive used to access the site.

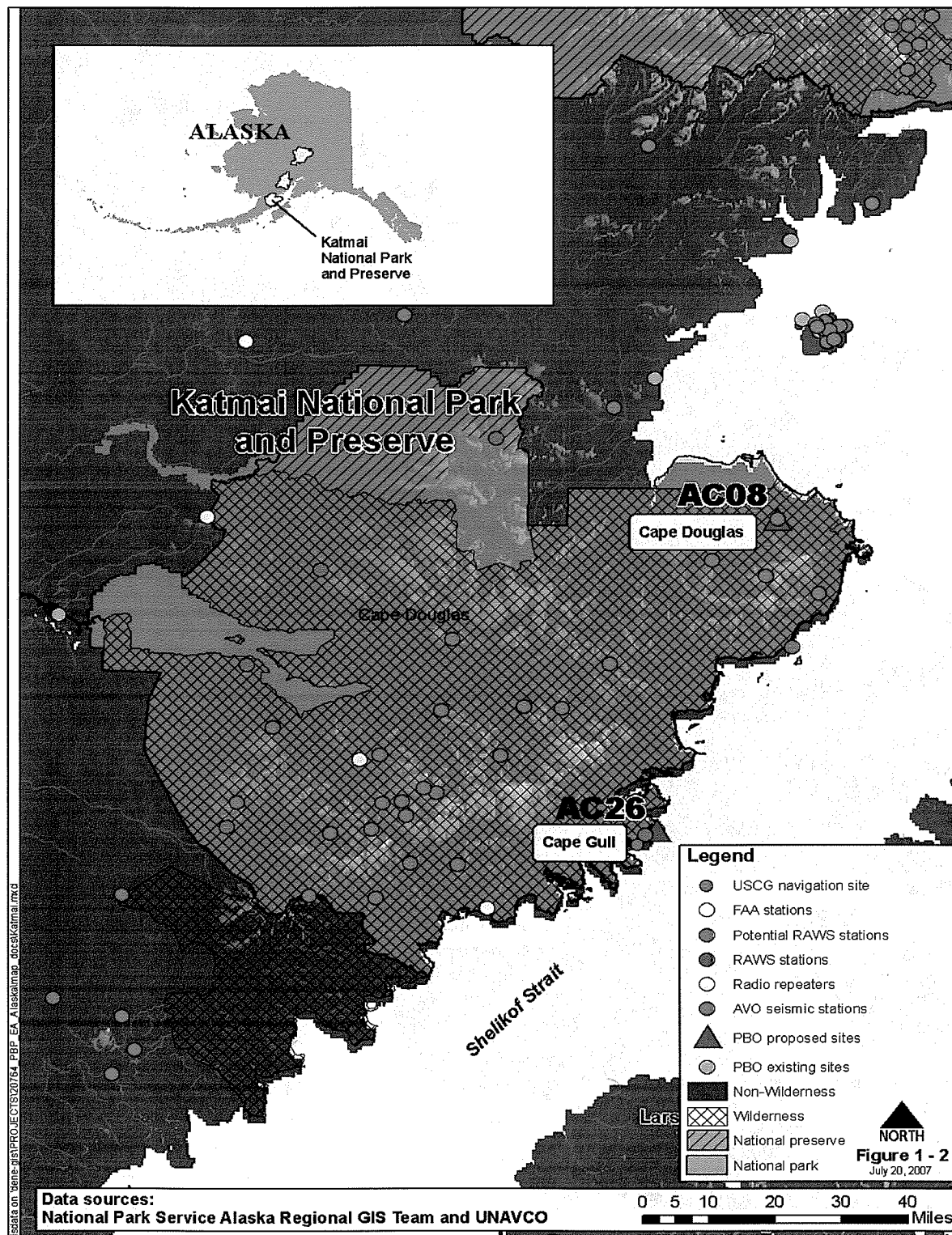
See enclosed maps for station locations.



Location of proposed and existing seismic stations in Denali National Park and Preserve. The two new PBO stations would measure and detect slip rates on the western end of the Denali Fault Zone.



Location of proposed and existing seismic stations in Lake Clark National Park and Preserve. New PBO stations in this park would be used to detect and monitor ongoing regional deformation from the Castle Mountain and Lake Clark Faults, and those associated with active volcanoes in the Cook Inlet region.



Location of proposed and existing seismic stations in Katmai National Park and Preserve. This park is known for its active volcanoes and is, therefore, the location of numerous other scientific, weather, and communication stations. New PBO stations in this park would be used to detect and monitor ongoing regional deformation from the 1964 Good Friday earthquake and help define slip rates in the eastern end of the Aleutian Subduction Zone.

PUBLIC INVOLVEMENT

The EA was released for public review and comment from July 31, 2007 to August 30, 2007. The EA was available online through the NPS Planning, Environment, and Public Comment (PEPC) public website. The NPS issued a press release announcing the availability of the EA and the public comment period on July 31, 2007. No public meetings were scheduled, and none were requested by the public.

Written comments were received from the National Parks Conservation Association (NPCA). The comments from NPCA required a formal NPS response (see errata for comments and NPS responses). No other comments were received from any government agency, tribal entity, interest group, or individual.

The NPS believes that the conclusions in the EA regarding the environmental effects of the proposed action support its decision to issue this finding of no significant impact.

DECISION

The NPS decision is to select Alternative B (NPS Preferred Alternative) with the mitigating measures. No modifications of Alternative B were made during or after the public comment period.

Mitigating Measures

The following mitigation measures apply to Alternative B.

Topic	Mitigation Measures
Vegetation	<ul style="list-style-type: none">• Although areas disturbed during installation would be kept to an absolute minimum and would be revegetated according to NPS guidelines, revegetation with native species is not considered feasible in some areas. Where revegetation with native species is not feasible, non-native species would not be used.• To prevent the transportation and introduction of invasive plant species to these remote locations, helicopters, installers' clothing and footwear, and installation equipment would be cleaned before and after each CGPS installation.
Wildlife	<ul style="list-style-type: none">• To reduce adverse impacts to wildlife and recreational users in the parks, helicopters would maintain a minimum altitude of 2,000 to 2,500 feet above ground surface, other than during landing and takeoff, or when visibility and conditions allow, pursuant to FAA Advisory Circular (AC91-36C), "Visual Flight Rules (VFR) Near Noise Sensitive Areas."• Consultations with USFWS would be made prior to installation and maintenance activities to determine flight routes and approaches (especially to Cape Gull, Cape Douglas, and Slope Mountain) so that murre, cormorants, kittiwakes, and other birds and animals with sensitivity to sound are not disturbed during times of vulnerability

Topic	Mitigation Measures
	(Squibb 2007).
Threatened & Endangered Species (Candidate for Listing)	<ul style="list-style-type: none"> • Vegetation disturbance would be limited to that necessary to implement the project and impacts to sensitive plant species would be avoided or minimized to the maximum extent practicable. • To comply with the Migratory Bird Treaty Act, helicopter activity would be scheduled in consultation with NPS personnel to avoid sensitive bird migration or nesting periods in the project areas, including typical seabird and raptor nesting and crane migration periods. Known seabird colony areas, especially along the Pacific coastline of Lake Clark and Katmai national parks and preserves would be avoided.
Wilderness Values	<p>Traditional best management practices (BMPs) that are always used during the construction and installation of PBO stations include the following:</p> <p><i>Solitude and Naturalness</i></p> <ul style="list-style-type: none"> • UNAVCO would follow “Leave No Trace” principles while operating on National Park Service lands. • UNAVCO would not damage or remove any natural feature. • All drill cuttings, grout, and other waste would be transported from the station site for disposal. • After the stations are operational, UNAVCO would conduct station site visits only to replace back-up batteries and to conduct routine maintenance. Station site visits would occur approximately once every three years for each station unless equipment malfunctions. • Batteries used to power the instruments would be gel cell types with no risk of spillage. Used batteries would be removed from the station site following replacement. • The equipment at each station site would be removed by the year 2018. In lieu of a removal bond, a certificate of deposit would be provided for each station in the amount of \$4,000 that would accrue interest at a market rate, payable to the Department of Interior/National Park Service. The certificate would remain with the station permit in the event that the station is turned over to another research institution. <p><i>Visitor Experience</i></p> <ul style="list-style-type: none"> • All flight plans would be designed to avoid high use visitor areas such as Brooks Camp and Three Forks overlook in Katmai National Park. • UNAVCO personnel would consult with NPS each season, prior to issuance of research permits, so that flight paths would accommodate park resources and

Topic	Mitigation Measures
	<p>management needs.</p> <p><i>Visual Resources</i></p> <ul style="list-style-type: none"> • Installations would be small and, except for the solar panels, colored to match the surroundings. Four weeks prior to the scheduled installation of equipment and as part of the logistics coordination and consultation process for each individual site, UNAVCO would provide plans and colors to NPS officials.
Cultural Resources	<ul style="list-style-type: none"> • UNAVCO would not remove, dig, excavate, disturb, injure, destroy, or in any way damage a historic or archeological resource, site, artifact or property. • If any archeological or historical resources are discovered during installation at any of the new stations, the installation would be halted and the NPS superintendent and park archaeologists would be notified as soon as practicable. No further action would take place until the NPS provides clearance, which would occur sometime after consultation with the State Historic Preservation Office and affected Native communities.
Subsistence	<p>Research activities would be conducted in a manner that would not restrict permitted subsistence uses.</p>

Permits

The NPS will complete Research Permits with UNAVCO to authorize installation and maintenance of six short drill-braced monuments of continuous GPS stations in each of the three subject parks (Denali, Lake Clark, and Katmai national parks and preserves) for five years with annual renewals for maintenance, and the entire system can be renewed for subsequent 5-year periods with annual maintenance renewals for as long as required to complete the project. A certificate of deposit (CD) for \$4,000 will be placed with the NPS for each PBO station to assure station removal at the end of the project, regardless of the final operator of the sites.

The research permits will detail the permitted station locations, limits of installation, and use of NPS facilities and other locations to safely manage fuel and landing of helicopters in the park. If any upgrades to the PBO stations or new stations are proposed, then additional NEPA compliance will be required. The Research permit will require investigator annual reports and annual coordination with the NPS for helicopter schedule and flight paths.

Rationale for the Decision

Alternative B: Plate Boundary Observatory Global Positioning System Network Installation and Maintenance in Alaska will satisfy the purpose and need of the project better than the No Action Alternative. Of the two alternatives analyzed, Alternative B effectively addresses the need to fill gaps in, and increase the accuracy of, the existing geodetic network, and provide the best possible detection of seismic signals in the seismically active national parks and preserves in Alaska.

Significance Criteria

The preferred alternative does not conflict with any of the following significance criteria (40 CFR Section 1508.27). Therefore, Alternative B will not have a significant effect on the human environment.

- (1) *Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.* The EA evaluated the effects of Alternative B on soils, vegetation, wildlife, threatened and endangered species (candidate for listing), wilderness values, cultural resources, seismic monitoring and hazard forecasting. The greatest adverse impacts on any of these features would be moderate and temporary adverse impacts on wilderness solitude and naturalness associated with helicopter activity during seismic station installation and maintenance; and minor long-term adverse impacts on wilderness solitude and naturalness associated with the physical presence of the seismic stations. The greatest beneficial impacts on any of these features would be minor long-term beneficial impacts on seismic monitoring and hazard forecasting. There would be no significant restriction of subsistence uses.
- (2) *The degree to which the proposed action affects public health or safety.* The proposed action would not have adverse effects on public health or safety.
- (3) *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.* Known unique characteristics are the wilderness areas of Denali National Park and Preserve, Lake Clark National Park and Preserve, and Katmai National Park and Preserve. The number of CGPS and seismic stations in designated wilderness would increase by six. There would be moderate and temporary adverse impacts on wilderness solitude and naturalness associated with helicopter activity during seismic station installation and maintenance; and minor long-term adverse impacts on wilderness solitude and naturalness associated with the physical presence of the seismic stations.
- (4) *The degree to which effects on the quality of the human environment are likely to be highly controversial.* The effects on the quality of the human environment are not likely to be highly controversial. A total of one public comment letter was received on the EA; the public comments do not indicate that a high level of public controversy exists.
- (5) *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.* The degree or possibility that the effects on the human environment would be highly uncertain or would involve unique or unknown risks is extremely remote.
- (6) *The degree to which the action may establish a precedent of future actions with significant effects or represents a decision in principle about a future consideration.* The degree or possibility that the action may establish a precedent of future actions with significant effects or represents a decision in principle about future considerations is extremely remote.
- (7) *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively*

significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts. The action would enhance current capabilities for seismic monitoring and hazard forecasting. The action is not related to other actions of individual insignificance that would amount to cumulatively significant impacts on the environment.

- (8) *Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.* There are no features in the project areas listed in the National Register of Historic Places. There are no known features in the project areas eligible for listing in the National Register of Historic Places. The degree or possibility that the action may cause loss or destruction of known scientific, cultural, or historic resources is extremely remote.
- (9) *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.* The action includes mitigation to avoid adverse impacts on nesting habitat and activity of Kittlitz's murrelet, a candidate for listing. The degree or possibility that the action may adversely affect this species is remote.
- (10) *Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.* The action would not cause a violation of any Federal, State, or local law or requirements for environmental protection. The Wilderness Act Section 4(c) prohibits installing a structure and landing aircraft within designated wilderness: however these activities were evaluated in wilderness minimum requirements/minimum tool analyses for each park, pursuant to NPS Management Policies at Section 6.3.6 Scientific Activities in Wilderness. These analyses show the scientific knowledge gained from the PBO project outweighs the projected impacts to the affected wilderness resources or values.

FINDINGS

The levels of adverse impacts to park resources anticipated from the selected alternative will not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the natural or cultural integrity of the park.

The selected alternative complies with the Endangered Species Act, the National Historic Preservation Act, and Executive Orders 11988 and 11990 for floodplains and wetlands. There will be no restriction of subsistence activities as documented by the Alaska National Interest Lands Conservation Act, Title VIII, Section 810(a) Summary Evaluation and Findings.

The NPS has determined that the selected alternative does not constitute a major federal action significantly affecting the quality of the human environment. Therefore, in accordance with the National Environmental Policy Act of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9), an environmental impact statement is not needed and will not be prepared for this project.

Errata

NPS RESPONSE TO PUBLIC COMMENTS

A 30-day public comment period was provided for in the EA from July 31, 2007 to August 31, 2007. One written public comment letter was received from the National Parks and Conservation Association, which contained substantive comments requiring a response from the NPS. Substantive comments are those that modify the existing alternatives, propose new alternatives not previously considered, supplement, improve, or modify the impact analysis, or make factual corrections. These comments did not change the EA conclusions about the effects of the proposed action or other alternatives. The comments and the NPS responses follow.

Comment:

While taken individually, each request seems reasonable. However, when looked at collectively, it paints another picture. We are growing increasingly uneasy by the volume of requests. We are in a period of time where technology is rapidly changing and the desire for structures in remote locations is escalating. The obvious question becomes “*How many is too many?*” We believe the time has come to take a long-term comprehensive review at each park. We recommend parks that receive numerous requests conduct a comprehensive assessment to address cumulative impacts and to develop clearer guidelines on how to evaluate scientific requests. Until we see the cumulative impacts evaluated and criteria on when and how to say “no”, we can no longer continue to support additional scientific and communication stations in parks.

Response

This comment addresses comprehensive planning and cumulative impacts analyses for installations of scientific research and monitoring stations in national park units in Alaska. Indirectly this comment calls for: 1) a new alternative to develop comprehensive management plans for installations of remote scientific structures in parks with many existing such structures and proposals for new ones; and 2) for cumulative effects criteria to determine when to reject or accept such proposals.

1) We have completed the Denali Backcountry Management Plan (BCMP), which addresses such new installations in zoning the park’s backcountry¹. The Denali plan calls for collocation of such facilities with other pre-existing facilities to the extent feasible. We accomplished this for the sites in Denali National Park and Preserve. Other sites have also been collocated where feasible; however, collocation with the USCG navigational facility near Cape Gull in Katmai was not reasonable because that location did not contain competent bedrock to locate the CGPS unit for the PBO project. The previously abandoned USCG navigational aid station was selected because it has competent bedrock and was previously disturbed. In Lake Clark National Park and Preserve one site is collocated with a NPS radio repeater and the second site is located in a new location where no other facility is available for collocation, but outside of designated wilderness.

¹ Completion of backcountry plans or GMP updates for other parks would assist with decisions on such proposals in the future. In the meantime we are following the lead of the Denali BCMP.

2) The EA contains extensive cumulative effects analyses and mitigating factors to reduce environmental effects. The NPS is currently working on a nationwide review process to address scientific research requests in national park wilderness areas; however, this review guide is not yet completed or available. Until this guidance is completed and available, we continue to address these proposals on a case-by-case basis using some of the criteria being discussed. We agree that cumulative effects criteria and thresholds for accepting or rejecting scientific research and monitoring facilities in national park system wilderness areas would be preferred, but for the present time we rely on best professional judgment and the Minimum Requirements/Minimum Tool analyses for nonfederal proposals.

Comment:

This EA states that the goal of the PBO network is for a total of 142 new CGPS stations in Alaska. It was unclear whether this will include additional stations in national parks after the six proposed here.

Response

UNAVCO has installed 98 of the proposed 142 stations in Alaska, and 8 more are projected to be installed this season, including 4 sites considered here. The Wickersham Dome site and Cape Gull would be installed next season. There are no other plans to install PBO CGPS stations in Alaska NPs.

Comment:

This EA does an excellent job in evaluating a number of useful criteria that could also be used for a Comprehensive Plan. For example we were pleased to see guidelines such as choosing sites outside of park boundaries and Wilderness when possible, co-locating sites with other equipment, having helicopters fly above 2,000 feet and avoid sensitive wildlife habitat and high use visitor areas, taking precautionary measures to prevent the introduction of non-native species, painting equipment to blend into the surroundings, and setting a removal date and requiring a bond or certificate of deposit to pay for the removal of equipment. Another criterion we feel would be helpful is one that evaluates the “degree of new information” a new installation would provide. For example, in this EA both Denali and Katmai would get two new seismic stations. Yet Katmai already has 23 seismic stations, whereas Denali has only three (and Denali is the larger park). It appears the two new Denali stations will yield a much higher degree of new information than the two Katmai stations. Assessing the amount of new information to be gained could be a useful tool in deciding which proposals to allow and which to reject.

Response

The proposed Plate Boundary Observatory continuous geographical position system (CGPS) units measure different properties than seismometers. Though related, the CGPS units are not the same as seismometers and they are not additive, but complementary. CGPS units measure earth

movements while seismometers measure the degree of shaking and vibrations. We agree assessing the amount of new information would be a useful tool in deciding which tools to allow.

Comment:

In addition to our opposition based on the need for comprehensive planning, we continue to be extremely hesitant to see permanent structures built as well as helicopters allowed in eligible or designated Wilderness because of the impact to wilderness values. We appreciate the information in the Minimum Tool Analysis for each park. However, we are unconvinced that these projects successfully passed *Step 1: Is it necessary to take action?* We also find it curious that UNAVCO's Exclusionary Siting Criteria table on page 101 says "*Exclude national parks*" and "*Exclude wilderness areas designated under the Wilderness Act*". It appears to us that unlike the Evaluative Siting Criteria that are used to compare possible sites within the tolerance zone that the Exclusionary Siting Criteria are absolute – in other words they are to be excluded from use. It is unclear to us why these exclusion areas were not followed.

Response

In Step 1 of the MR/MT Analyses only one of three criteria must be satisfied to allow a project to proceed in wilderness. The analyses show that the project facilities cannot be located outside the park wilderness areas and provide the level of detail needed to clearly understand large geological processes and events such as volcanic eruptions and earthquakes. Such events can also radically alter the health, management, and administration of the park areas. Therefore the NPS believes the information gained about the volcanoes and faults outweighs the small effects to wilderness from the installation and infrequent maintenance trips for small CGPS stations, especially those collocated with pre-existing facilities. The UNAVCO evaluative siting criteria are mostly applied to locations in the contiguous United States, and even there PBO CGPS stations are located in Yellowstone NP. There the stations tend to be located near the road system and power sources, but in Alaska the parks are often even larger and more remote, thus making location of such facilities in non-wilderness less possible. Therefore, locating the PBO CGPS stations in some park wilderness areas is necessary to obtain accurate measurements of these large plate tectonic forces to understand their effects on the park units and the visiting public.